Strong '84 performance opens opportunities for '85

At shareholders' meeting, company reports record $5 billion backlog at start of '85

The buzzword at the April 18 annual meeting was "opportunity," as Grumman Chairman Jack Bierwirth explained the rationale for the company's new facilities, new technologies, and new leadership.

"We have an attractive array of new business opportunities before us," he said. "Ironically, the more successful we are in seizing these new opportunities, the more start-up investment we have to make at the expense of short-term profit results."

More than 1,000 shareholders and others who came to the Plant 4 hangar learned that long-term investments had some effect on profits in 1984. Grumman reported sales of $2.6 billion during the year, up from 1983 sales of $2.3 billion. Net income was $108.4 million, down slightly from the $110.7 million posted in '83.

Bierwirth told attendees that he expected first-quarter 1985 results to be slightly above the 85 cents per share reported in first quarter 1984. "I think 1985 will be another good year for Grumman," he said. "But it will probably disappoint Wall Street a bit because we're going to continue to invest for the future."

Bierwirth also said Grumman was in the midst of a "critical time of transition," citing the recent reorganization of the company into 10 operating divisions. "The basic objectives of the new organization are simple enough. We see our markets changing. We see Grumman doing business with new and different customers, offering new and different products and services," he said.

"The new organization matches operating divisions with major market segments," he continued. "It's important that each of our customers knows the Grumman division with which he does business is dedicated to that customer's concerns."

Bierwirth praised the leadership of Joe Gavin, recent past president of the corporation. He said Gavin led the company through some of its greatest postwar achievements.

"No other company in the world can claim for its legacy the first landing on the moon and the lifeboat mission that saved Fred Haise and his crewmates," he said. "Since 1976, Joe has been our president and chief operating officer through a time of change and challenge that has seen our sales and equity double, our earnings increase four times, and, I think it's fair to say, a time in which Grumman has become recognized around the world as the premier producer of flying electronic systems."

The company is making changes to better control costs and pricing — and the time is opportune. Bierwirth confronted one very sensitive topic: the recent charges of spare parts overpricing, improper gifts, and other practices by government contractors. He noted that Grumman is doing everything it can to avoid "even the appearance of an abusive practice."

He pointed out that Grummanites are required to attend seminars and watch videotapes on proper business practices. He also cited the Spares Awareness Program, launched in 1984, which provides cash awards to employees who suggest ways to improve the spares system.

"In the 30,000 spare parts that we supply our customers, you can be sure that we have some overpriced — or apparently overpriced — items, too," he said. "But we're trying every way we can to get them out of the system. Since we started paying a bounty, Grumman people have identified a number of parts for review — and we're still looking."

A highlight of the meeting was a screening of a videotape that traced the development of the X-29 from the design stage, through production and testing, up through the test flights. Following the tape, Bierwirth read an announcement that two days earlier, the X-29 completed its eighth flight with "zero discrepancies."

"What a great thing to be a part of — the forerunner of a whole new generation of aircraft, a whole new generation of technology," Bierwirth remarked.

Grumman President George Skurla drew analogies between the Grumman X-29's forward-swept wings, and the forward-thinking in-

(Continued on page 2)

Grumman Chairman Jack Bierwirth (R) and Grumman President George Skurla fielded questions from shareholders at the annual meeting on Thursday, April 18.

After viewing a videotaped update of the X-29, shareholders had the opportunity to ask questions about their company.

D'Amato addresses PAC

Senator from N.Y. calls Grumman "an indispensable ingredient in the defensive strength of the United States"

Senator Alfonse D'Amato (R-N.Y.) shared his views of the current political scene with members of the Grumman Political Action Committee at the annual PAC meeting, held Wednesday, April 17. During his keynote address, D'Amato called Grumman an "indispensable ingredient in the defensive strength of the United States."

Also in attendance at the annual gathering were three members of the Long Island congressional delegation — Bill Carney, Norman Lent, and Bob Mrazek.

Commenting on the subject of the 1986 defense budget and its relationship to the growing budget deficit problem, D'Amato admitted that military spending will have to undergo some cuts.

"There are areas within the current military budget that warrant being carefully scrutinized for possible cost savings. However, we cannot afford to cut out programs, such as those here at Grumman, that constitute the muscle and bone of our nation's defensive strength," stated the senator. "The problem of the budget deficit will not just go away, but it also can not be solved simply by chopping away at the defense budget.

"Given the increases in the level of Soviet military spending, I believe that the three percent real-growth figure President Reagan has offered in his most recent budget proposal is correct," asserted D'Amato. "I do not think that we should go below that level and I intend to support that mark with all the vigor at my command."

D'Amato commended the Grumman PAC members for their support of the democratic process. Grumman Corporation Chairman Jack Bierwirth also congratulated PAC members for "becoming leaders of the effort to increase political consciousness. Grummanites have always been leaders in their community and it is good to see that tradition extending to Washington and the larger issues that confront our country today."

The three Long Island representatives also shared their opinions with

(Continued on page 4)

Commenting on balancing the budget, Sen. Alfonse D'Amato told PAC members: "We cannot afford to cut out programs, such as those here at Grumman, that constitute the muscle and bone of our nation's defensive strength."

Grumman on winning team for major Space Station design

Grumman is on a winning industry team that will do systems definition and preliminary design work on the largest of the four Space Station work packages.

On Monday, April 15, the National Aeronautics and Space Administration's Johnson Space Center in Houston, announced the selection of the Rockwell-led team for work package 2. Grumman is a subcontractor to Rockwell International's Space Station Systems Division in Downey, California.

Work package 2 covers the structural framework onto which the various Space Station elements will be attached; a module with sleeping quarters, wardroom, and galley; and extravehicular activity (EVA) systems.

The contract also includes the interfaces between the Space Station and the Space Shuttle — mechanisms such as the remote manipulator system, attitude control, thermal control, communications and data management systems.

In addition to Grumman, the Rockwell team includes Harris Corporation's Aerospace Systems Division in Melbourne, Florida; Sperry Corporation's Aerospace and Marine Group in Phoenix, Arizona; Intermetrics in Huntington Beach, California; and SRI International in Menlo Park, California.

A team led by McDonnell Douglas Astronautics Company of California won an identical contract. Both teams are still negotiating the final contract amount with NASA, which has a ceiling of $27 million for each.

Commenting on the NASA announcement, Grumman President

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Grumman continues to invest in the future

(Continued from page 1)

vestments Grumman is making in new technologies.

Skurla called 1984 a historic year, not only due to the X-29, but because of the $1.3 billion firm fixed-price development contract for the F-14D and A-6F. "These two development programs are now fully under way, assuring continued procurement of these aircraft well into the Nineties, and should result in revenues in excess of $20 billion for your company over the years ahead," he stated.

Skurla said that the new corporate structure puts Grumman in a better position to take advantage of the technologies it has fostered over recent years. He also pledged that the "New Grumman" company will retain high standards of design excellence and product quality.

"At this mid-point of the decade, perhaps the most striking characteristic of the new Grumman Corporation is the company's momentum," he said. "You can feel it, you can sense it, and with all the new construction going on, you certainly can see it!

"Expanding on the chairman's opening remarks, in the last five years, the company's sales have doubled, and in the last ten, they have gone up by a factor of two and one-half," he continued. "Our sales in 1984 were at record levels. And our business backlog, as we began 1985, was in excess of $5 billion — the highest ever and nearly double that of only five years ago. Over the long term, we expect that pattern of growth to continue as our business evolves and expands."

Skurla said the electronics field holds lucrative business opportunities for Grumman. These include the $1.6 billion Air Force/Army J-STARS program, an airborne radar system designed to counter the threat of enemy forces in Central Europe; and the Navy Consolidated Support System, a highly sophisticated automatic test system.

Skurla also noted that Grumman is back in the space business in a big way. "We are actively participating in this nation's new space project, the Space Station program," he commented. "In the past month, we won three out of the four study contract competitions held by NASA. These study contracts will put us in a good position to go for the full-scale hardware programs two years from now."

Other space efforts at Grumman include portions of President Reagan's Strategic Defense Initiative, and the Space Transportation System Operations Contract at Houston.

Skurla also mentioned the strong growth opportunities in Data Systems and Vehicle and Marine divisions. The Data Systems division began 1985 by winning a $42 million NASA contract to integrate, install, and maintain an extensive engineering analysis and data system at Marshall Space Flight Center in Alabama.

Grumman Olson is competing for a contract that will have considerable impact on Grumman's commercial operations. The $1 billion contract is with the U.S. Postal Service for a minimum of 99,000 long-life postal vans. It will be awarded later this year.

"The Postal Service is putting our prototype vehicle through an exhaustive series of road tests," said Skurla. "And up to this point we are running well ahead of the competition." ■

At right, newest board members Edward Brooke (R) and Victor Hao Li (L) chat with Vice President George Brown.

The ayes have it

During the business portion of the annual meeting, shareholders elected board members, ratified two amendments to the corporation's charter, and approved the selection of an independent accounting firm.

Five directors were elected for a term of three years. They are: Edward Brooke, partner, O'Connor & Hannan, Washington D.C.; John Carr, vice chairman of the board, Grumman Corporation; Orville Freeman, senior partner, Papham and Haik, Washington D.C.; Victor Hao Li, president, East-West Center, Honolulu, Hawaii; and Ellis Phillips Jr., president, Ellis Phillips Foundation. In addition, Mike Pelehach, president of Grumman International, Inc., was elected for a term of two years.

Shareholders also voted in favor of adding two new amendments to the corporation's Certificate of Incorporation. Similar actions have been taken by shareholders at many other Fortune 500 companies.

Both amendments are designed to protect the interests of the corporation and its shareholders in the event of a potential takeover.

Called the "two tier" offer, the practice of making a more attractive offer for shares tendered early in a takeover attempt often works to the disadvantage of those tendering at the end of the process.

A good example: in September 1981, LTV made a tender offer for a minimum of 7,100,000 shares of common stock in Grumman (approximately 50.1 percent of the company shares) and a maximum of 10,000,000 shares (about 70 percent). At the same time, it reserved the right to pay a price less than the tender offer amount for the balance of the shares.

The problems caused by partial offers and two-tier pricing have resulted in at least nine states recently adopting legislation to curtail such practices. No such legislation has been enacted in New York, where Grumman is incorporated. The first of the newly approved amendments to the company's Certificate of Incorporation will provide protection against two-tier pricing during a takeover attempt and deal with obtaining an adequate price for the company stock.

This amendment does not impede a takeover that is approved either by the board of directors prior to a shareholder acquiring 10 percent interest in the company or by a "super majority" of the shareholders — 85 percent. (Complete details of this amendment can be found in the company's proxy statement on pages 21-30.)

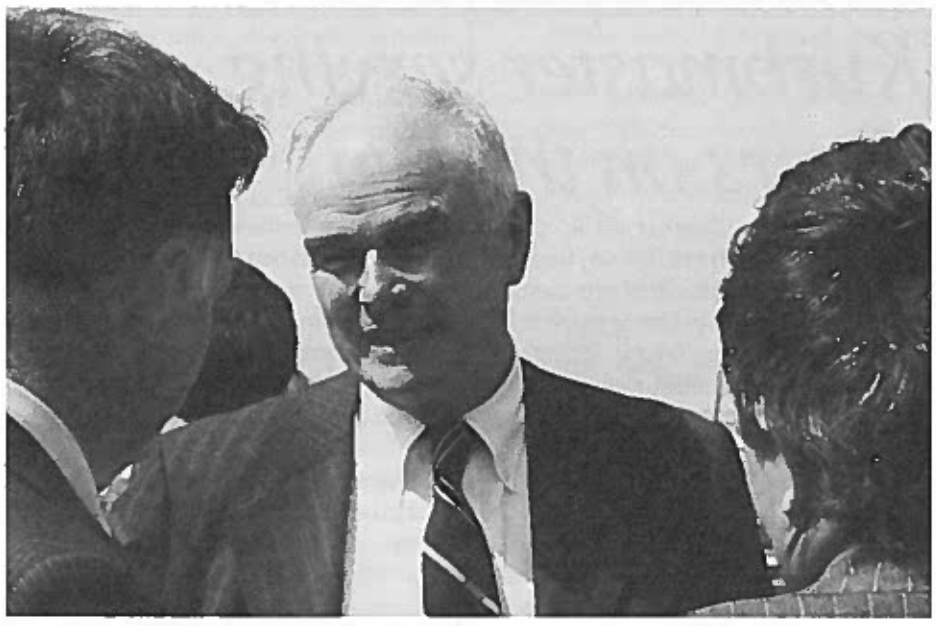
The second of these amendments places in Grumman's Certificate of Incorporation several provisions currently contained in the company's bylaws. These bylaws pertain to the classification of the board into three groups of directors with overlapping three-year terms. It also establishes certain requirements for calling special shareholders meetings, and submitting meeting proposals. In addition, a "super majority" — 85 percent — of the shareholders must approve changes to the corporation's bylaws and Certificate of Incorporation, if there is a shareholder who owns 10 percent.

While assuring the continuity and stability of the corporation's business strategies and policies, the new amendment makes it more difficult and time-consuming to change board members. This reduces Grumman's vulnerability to an unsolicited takeover attempt and encourages direct negotiation between the board of directors and a potential acquirer.

In such situations, the imminent threat of removal of the company's board would deprive the directors of the time and information necessary to evaluate the takeover proposal, to study alternate proposals, and to help insure that the best price is obtained in any transaction. The second amendment will provide such protection to the shareholders. (Complete description of this amendment can be found on pages 30-36 in the blue proxy booklet mailed to all shareholders.)

At the annual meeting, the shareholders also approved the appointment of Arthur Andersen & Co. by the board of directors as independent certified public accountants to audit the accounts of the Corporation and its subsidiary corporations for the year ending December 31, 1985.

At the annual shareholders' meeting, Chairman Jack Bierwirth introduced the people who will play a big part in the company's restructuring. They are (L to R) Dan Huebner, Grumman Corp. senior vice president-Marketing/Development; and Bob Myers, Grumman Corp. senior vice president-Services Division. The division presidents are: Alex Alexandrovich, Space; Renso Caporali, Aircraft Systems; Fred Haise, Technical Services; Tom McGrath, Aerostructures; Bob Nafis, Electronics Systems; John O'Brien, Data Systems; Ron Peterson, Allied; Al Verderosa, J-STARS; and Joe Walter, St. Augustine.



Grumman Chairman Jack Bierwirth (C) talks with shareholders at the annual meeting on April 18.

Shareholders optimistic

Following this year's annual meeting, shareholders were generally optimistic about the company's pace in expanding its traditional areas of business. Their optimism was bolstered by the announcement that the X-29 technology demonstrator had completed its eighth flawless flight two days earlier.

"It's hard to think of the company, such a wonderful aircraft manufacturer, becoming even more electronically involved, but we have to move along with the times. I think it's pretty safe to say that electronics is the name of the game," said John Matthews, a retiree who began with the company in 1941. "I have no doubt that our investment in the X-29 will pay off in the long run."

Shareholder Robert Phelan agreed. "If we were guilty of anything in the past, it was of being too ironbound, concentrating on a demonstrated quality product. These days the market and the competition are more important than ever before. I'm happy to see the company positioning itself to be able to compete in many different areas. I think the X-29 will prove to be a very good investment over the years and I look forward to some exciting prospects in competing for such things as the space station.

But some of the attendees were a little more cautious about the future.

Said longtime stockholder John Voss, "I know the future holds many prospects, just as it always has, and I back management. Still, it seems we've come such a long way and made so many changes in the last few years. Only time will tell if we're moving in the right direction. We'll just have to wait it out."

Keith Crews, a vice president of Citibank, cited the need for investment in the future that the X-29 represents. "What especially surprises us at the Grumman annual meetings is the tremendous participation by the employees and shareholders in general," said Crews. "That certainly says a lot about their feelings for the direction the company is taking." ■

World changes to monthly paper

Grumman World has a new look — and a new publication schedule, too.

Grumman World will continue to be the publication for all Grumman employees and retirees — but in order to bring you more news about what's going on in our changing company, we'll be coming out once a month instead of just four times a year.

The new approach makes it more newspaper than magazine, but we'll continue to run features about Grumman people who are making a difference in the company and in their communities; and about political, social, and economic changes that affect our business.

We want to know what you'd like to see in *Grumman World*. We welcome your ideas and suggestions, and we'll incorporate them wherever possible . . . because this is your company, and this newspaper is for you. ■

Nightingale elected corporate VP; Watson appointed F-14 program VP

On Thursday, April 18, the board of directors elected a new corporate vice president, approved the appointments of divisional officers, and the appointment of new program vice president in Aircraft Systems.

In keeping with Grumman's recent restructuring, all subsidiary officers have been retitled as divisional officers to reflect their responsibilities in the new divisions.

The board also elected Ray Nightingale a corporate vice president. Formerly a Grumman Aerospace vice president, Nightingale will serve as assistant to Grumman President George Skurla.

Nightingale joined Grumman in 1969 as deputy director of Operations Planning and Budgets. When Grumman Corporation formed Paumanock Leasing Services, Inc., in July 1973, he was elected vice president-operating manager. The subsidiary was later renamed Grumman Credit Corporation, and in 1974 Nightingale became the subsidiary's president.

Prior to joining Grumman, Nightingale was a contracts supervisor with the Bogue Electric Manufacturing Company of Paterson, N.J., and manager of contracts administration and program planning control for the Reaction Motors Division of the Thiokol Chemical Corporation of Denville, N.J.

A veteran of both the Army and Navy, Nightingale currently holds the rank of major in the Army Reserve. He is a graduate of Seton Hall University.

In addition, the board approved the appointment of Bob Watson as program vice president for the F-14 in the Aircraft Systems Division.

Watson joined Grumman in 1955, after two years as a design engineer with Fairchild Camera & Instrument Company. He served as group leader of Guidance, Navigation & Control for the A-6 and WF-2 programs. He left Grumman in 1962 and spent four years with Honeywell.

He rejoined the company in 1966 as engineering manager, Apollo Applications Program. From 1969 to 1972, he served as deputy manager, Orbiter Vehicle, Space Shuttle Program.

In 1972 Watson took over as program manager, Space Programs. Two years later, he was named deputy director of System Engineering. He joined the F-14 program in 1976 as engineering manager, subsequently serving as deputy director-Technical and program director, F-14 Development Program.

Watson holds a bachelor of science degree in Applied Physics from Hofstra University and is a graduate of the Executive Development Program of Cornell University. ■

On April 18, Ray Nightingale was elected a Grumman Corporation vice president.

Bob Watson has been named F-14 program vice president in Aircraft Systems Division.

PAC thanks Messina, Ochenrider

(Continued from page 1)

the PAC members on issues of the day.

Congressman Lent noted that the development of political action committees across the country has enabled political officials and candidates to broaden their base of support. "It is always comforting for me to know that the Grumman PAC is behind me when I cast my votes in Congress," he stated.

Congressman Mrazek, the only Democrat official sitting on the dais, noted that tackling the issue of the budget deficit will be a difficult task. "The challenge before us is considerable — how to reduce the budget deficit without weakening our defense.

"It will require a lot of difficult decisions and a bipartisan political effort," said Mrazek. "Long Island's Republican and Democrat representatives alike will be needing your full support to make sure everyone gets a fair deal."

Commenting on the question of the defense budget, Congressman Carney noted: "If we do end up with a defense budget based on the three percent over inflation rate figure, there will be significant cuts to some programs. However, Grumman's current programs should remain operating at healthy levels well into the future."

Vice President Dave Walsh, PAC Steering Committee chairman, read two resolutions for passage by PAC members.

The members voted to re-elect Grumman Data Systems Vice President John Bohlander as PAC Steering Committee vice chairman, and Bill Ryan as assistant treasurer.

The second resolution unanimously approved by the members called for an official PAC thanks to Gordon Ochenrider and Frank Messina for "their valued services as members of the Steering Committee, their initiative, and their leadership." Ochenrider and Messina recently completed their tenures on the committee. ■

Several hundred Grumman Political Action Committee members attended the annual PAC meeting in Plant 4 to hear keynote speaker Sen. Alfonse D'Amato.

Grumman Olson's durable aluminum-body Kurbmaster is being used by Hokka-Hokka-Tei in Tokyo to sell sushi and other Japanese fast food.

Kurbmaster serving diners on the run

If you have a "sushi attack" or a craving for tempura in Tokyo, head for the Grumman Olson Kurbmaster's Hokka-Hokka-Tei catering truck.

Hokka-Hokka-Tei, a large Japanese fast food retailer roughly equivalent to McDonalds, has been selling sushi, tempura, beef salad and rice from its customized Kurbmaster throughout Tokyo for more than a year now.

Grumman International cracked the Japanese market for truck bodies two years ago. Curbside dining is as popular in Japan as fast food joints are in the U.S. Food catering companies in Japan needed a durable and custom designed truck to handle the job. "We think the Kurbmaster, with its long lasting aluminum body and its multitude of options, is well suited to fill that need," says Roger Carson, director of Commercial Programs — Grumman International.

C. Itoh, a huge Japanese trading company, was the first to approach Grumman about using the Kurbmaster van to sell mobile meals. While Grumman Olson manufactures the aluminum truck bodies, some of the specialized customizing needed to suit the needs of the hot-truck market are done by subcontractors.

The success of Hokka-Hokka-Tei's Kurbmaster was only the beginning. A group of Chinese visiting Japan also liked the Kurbmaster. As a result, Grumman Olson has received an order to manufacture three Kurbmasters that will be outfitted to sell fried chicken to factory workers in China.

"Fried chicken is a real big favorite of the Chinese people, and Chinese food caterers feel the hot-truck concept is a perfect way to reach the country's huge market of factory and office workers," says Carson.

Closer to home, the hot-truck market is also heating up in California. Grumman Olson in California is working with AA Cater Truck Manufacturing Company to custom design vans for the Los Angeles area.

"Just about everyone in the L.A. area commutes daily. Californians will tell you that they practically live on the freeways and highways. So they eat a lot of their meals on the roadside. That means a big market for mobile food caterers out here," says Ray Fencl, Grumman Olson's Southern California regional sales manager.

There are currently more than 3,000 hot-trucks plying their trade in L.A. and its surrounding suburbs. Last year, some 250 Kurbmaster vans joined the ranks. The company expects sales to increase this year, thanks to the strong testimonials praising the superiority of the Kurbmaster's aluminum body.

"Many catering truck manufacturers, such as AA Cater Truck and Wyss Brothers, have always used steel-body vans," says Fencl.

Food vendors became dissatisfied with the inevitable rusting and the expense of constant painting and upkeep that is characteristic of steel bodies, notes Fencl. One such vendor, Atlas Foods Company, purchased a Kurbmaster van just for supply deliveries some years ago. After five years, it noticed that the van still looked brand new.

The Kurbmaster hot-truck vans prowling the streets of L.A. are manufactured at Grumman Olson's Tulae, California plant. In order to fit all the kitchen and refrigeration equipment, these customized vans are slightly larger than the standard models, measuring 15 feet long, 80 inches tall, and 82 inches wide.

"Right now the catering truck business seems to be mostly a California phenomenon," says Fencl, "but our catering truck customers have been shipping modified Kurbmasters to vendors all over the country." ■

Composite nuke shield takes shape in Ga.

How would the Army protect military equipment in remote field locations during a nuclear attack? One method is to house the equipment in heavy metal shelters that might withstand a nearby nuclear blast. However, moving these heavy protective structures is very difficult and expensive.

Milledgeville Operations (GA) is working on a project that might lighten the load. The company's advanced composites manufacturing center is currently modifying a blast shelter wall by using composite materials. Work is being conducted under a contract with Kamam Avidyne, a division of Command Sciences Corporation, Burlington, Massachusetts.

Layup mechanic Charlie Mimbs works on the beam for the nuclear blast wall being assembled in Milledgeville, Ga.

The prototype composite blast wall is 20 feet tall, eight feet wide and approximately six inches thick. Composite materials are being used to achieve weight savings while maintaining protective characteristics.

"In fact, we can even improve the protective capabilities of the structure by using composites and modern technology," says Sal D'Ambrosio, program coordinator for the project.

He notes that a special thermal coating applied to the graphite-composite skin will greatly enhance its heat-shielding ability. An aluminum honeycomb core is being used to stiffen the wall. This provides significant strength without the weight disadvantages of solid metal.

At completion, the project will have used approximately 750 pounds of graphite tape, 52 square feet of aluminum honeycomb core and 3,500 fasteners.

The completed shelter will be shipped to the U.S. government's military test site in White Sands, New Mexico, at the end of the month. After reviewing the test results, the Army will determine if the construction is feasible. ■

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Grumman gets go-ahead for major Space Station package

(Continued from page 1)

George Skurla notes that Grumman and Rockwell have a 20-year association in manned space programs. "We are delighted to be a part of the Rockwell team," he says. "Together we have landed men on the moon and built the Shuttle, the world's first reusable space transportation system. Now we are ready to move this country into space on a permanent basis."

Adds Rockwell Chairman Robert Anderson: "With an operational Space Shuttle and a national commitment to build a Space Station by the mid-1990s, America will maintain its leadership in the effective uses of space, and open a new era of scientific and industrial triumphs. Rockwell is committed to be part of that program.

"We have been the preeminent industrial contributor to the nation's manned space effort since the Apollo lunar landing and the knowledge we have accumulated since that time certainly will be applied to this program," he states.

Last month, NASA awarded smaller contracts to six teams for work packages 1, 3 and 4. Grumman was on two teams that won: the General Electric-led team for work package 3, and the TRW-led team for work package 4.

Dick Kline, Grumman's director of Space Station Programs, says working on three out of four of the work packages puts Grumman in a favorable position for hardware contracts.

"Our primary goal was to work on the NASA/JSC work package with Rockwell," he says. "Not only did that happen — but in naming the winners, NASA narrowed the competition to just two teams."

Kline explains that all three competing teams — Rockwell's, McDonnell-Douglas,' and a third led by Lockheed — were strong. Consequently, there was some speculation that NASA might award three identical contracts.

Kline adds that having a role on three of the four work packages enhances Grumman's outlook because it gives the company a better perspective on the overall job. Work package 3 encompasses free-flying platforms, attached payloads, and science lab outfitting, as well as the service, maintenance, and repair of these elements. Work package 4 covers the electrical power generation and conditioning, and storage systems.

Ron McCaffrey is the Grumman program manager for the subcontract. The effort will involve about 80 Grummanites.

Plans call for the Space Station to have a crew of six at the outset (over the long term, expansion would permit the accommodation of up to 18). The six astronauts will work in two teams of three persons each on 12-hour shifts. Each crew will be on duty six days a week and be capable of performing up to 18 hours of work outside the vehicle during that period. Thus, *human factors engineering* will be critical.

Grumman is Rockwell's main subcontractor on work package 2. It accounts for approximately 25 percent of the total contractual pie. Grumman's role will be to study various interior designs for the crew's living quarters, the command-and-control center (akin to a ship's bridge), and thermal control and EVA systems. Kline notes these three areas of concern are all naturals.

"Developing the architecture for the command and control functions will involve a lot of the skills and technologies we use in cockpit development for production aircraft, as well as previously for the Lunar Module," he notes.

The EVA segment of the subcontract calls into play other strengths. The Grumman-developed manipulator-foot restraint was instrumental in the rescue of the Solar Max satellite in April of '84. Grumman is also working on a design requirements study for an advanced EVA system.

Furthermore, Grumman has become a leader in the field of thermal systems. Over the past few years, it has had NASA technology development contracts for space-constructable radiators and thermal-bus technology. Soon to fly aboard the Space Shuttle will be an experimental radiator designed and built by Grumman. ■

This full-scale mockup of a Grumman-designed Space Station module is housed in the new mockup building behind Plant 5 in Bethpage.

CSS: Navy's future electronic test system up for bids

Grumman prepares proposal for next generation of test equipment

Grumman recently entered into a critical 45-day proposal period in its efforts to win a $3 to $4 billion contract to provide the U.S. Navy with electronic test equipment through the year 2000.

The proposal is for a five-year $200 million full-scale development contract for the Navy's consolidated support system (CSS). Grumman's bid is due in May.

CSS calls for the development of standardized test equipment for a majority of the electronic components used to operate aircraft, ships, and submarines. CSS will eventually replace the current generation of automatic test equipment (ATE).

Grumman is competing against three other teams for a production contract that will be awarded in 1990. As prime contractor, Grumman is teamed with General Dynamics Electronics and Hughes Aircraft. The three other teams are headed by Harris Corporation, General Electric, and Sperry Electronic Systems.

The CSS contract is being awarded in three phases. The first studied various ATE concepts as well as maintenance problems and information management.

Phase Two has been split into two parts. Part one, which is to begin in August, calls for a total system design. During this segment, two contractor teams will be selected to compete in a fly-off of their respective CSS designs. Part two involves full scale development of those plans.

Phase Three calls for production of approximately 500 CSS units over a seven-year period.

"The problem that exists today is every time the Navy purchases a new electronic subsystem it has to buy new test equipment as well," says James Reed, Grumman's CSS program manager. "No commonality exists between test equipment and that just proliferates the amount of support, spares and publications needed to keep the fleet ready."

Reed estimates that there are more than 5,000 different test programs now used by the Navy. The ATE used for naval aircraft alone is located in shops on 12 aircraft carriers and at 12 major air bases. Overall, the Navy operates test equipment at 130 sites worldwide.

ATE can automatically determine the condition of electronic boxes and circuit cards by identifying failed components under computer program control. It could take an engineer between eight months to a year to discover all the possible circuit paths leading to a single fault. This information is then incorporated into various ATE test programs. ATE ensures that naval weapon systems and Grumman planes are operational. It also is used to see that electronic boxes return quickly to service.

Although today's ATE remains effective because of the Navy's increasing dependence on complex electronics, the test systems needed to support these instruments are equally sophisticated. ATE shops are filled with bulky computer consoles, hanging cables and confusing dials. The equipment demands operation by skilled technicians and maintenance personnel.

"The whole CSS concept is geared toward moving away from the 'rack and stack' approach now in service and designing a streamlined network which uses standard microprocessors to perform a variety of test functions," says Reed.

To develop a system that meets all the Navy's CSS requirements, Grumman has built a technology demonstrator called System-X. Basically, the unit incorporates various software programs to take the place of computer hardware. Using general purpose hardware saves valuable space and allows the system more flexibility. New test functions can be included by adjusting a program, rather than adding another console or test rack.

Other System-X features include high-resolution color graphics that can zoom in on a troubled circuit board. If a home television could produce as clear a picture, viewers could see the stitching on a football during a game. System-X also talks, giving computer-generated voice commands.

"We've been involved in developing this technology for the past five years," says Reed. "It was a worthwhile investment because the successful implementation of CSS directly affects the readiness of our aircraft."

Reed states that projections show a fully installed CSS could increase the readiness of Navy aircraft by 10 to 20 percent. Improved turn-around time and reduced equipment inventories may save the Navy as much as $3 billion over a 15-year period. CSS equipment is expected to take only half the room of current ATE, thus significantly reducing the space requirements of avionics shops onboard a carrier. The need for test personnel will also be cut in half.

"The Navy is looking for a simpler, more compact and reliable network of test equipment. Reducing maintenance costs and increasing support is what CSS is all about," adds Reed.

While developing the proper equipment is an important part of Grumman's CSS bid, planning an orderly transition is the real challenge. CSS units must be flexible enough to work in conjunction with existing ATE.

"CSS must be designed to handle current and future electronic systems into the year 2010," says Reed.

Grumman expects the Phase Two award to be made by early fall. At that time, the winning contractors will each design a system for evaluation by the Navy. ■

R.A. Lokkeberg

C.J. Rizzuto

A. Naporano

F.A. Matuszek

W.V. Muller

B.T. Degnan

R.S. Kito

D.J. Winthrop

Service Milestones

45

William F. Hejl, Controls (2)

35

Angelo Pomponio, Fus. Assy. (1)
Joseph P. Armstrong, Elect. Insp. (4)
Gene W. Harms, Crew Sys./Equip. Integ. (5)
Nickolas Munzing, Cent. Shipping & Pkg. (17)
Paul F. Langhauser, Veh. Lia. Eng. (31)
Dorothy Wesnofske, Grumman Corp.

30

Joseph E. Komp, Drop Hammer (2)
Robert W. Clair, Mach. Ops. Serv. (3)
Anthony Collura Jr., Corp. Matc. Ops. Mgt. (5)
Leslie P. Wittekind, Struct. Test (5)
James V. Digilio, Prod. Dev. Ctr. (5)
George P. Scheuerlein, Bus. Mgmt. & Anal. (5)
George R. Petheram, ILS Elect. Pkg. (6)
Winslow W. Peters, Forming Heat Trt. (11)
Charles F. Morris, Maint. (12)
Arthur Berman, Cont. Sys. Eng. (30)
James H. Boyd, Comp. Sys. Opers. (35)
Robert J. Kennedy Jr., Funct. & Proj. Admin. (35)
Stephen G. Bellanca, Dept. Ops. Mgt. (35)
William Borruso, Prod. Train. Mgt. (39)
Gerard Cudone, Pwr. Plt. Des. (40)
Charles B. McLaughlin, Aerodyn. Staff (40)
William J. Cody, Prod. Cont. (43)
Kenneth J. Walch, Mgmt. Personnel (43)
George E. Stolworthy, Mil. Space. (286)
Arthur H. Meyer, Supplier Cont. (289)
Gerald D. Markham, Site Mgr. (525)
Joseph Morales, Technical Services — Inst. Meas. & Calb.

25

Raymond A. Lokkeberg, Lab. Ops. Mgt. (1)
Gerald H. Hermges, Mech. Struct. & Proto. (2)
Christopher J. Rizzuto, Mach. Oper. Tech. Serv. (3)
Alfonso Naporano, M.O. Mgt. (3)
Francis A. Matuszek, ILS Sys. Concepts (4)
Walter V. Muller, Supt. Equip. Prod. (5)
Brian T. Degnan, ILS Proj. Mgr. (6)
Robert S. Kito, Trans. Ops. (6)
David J. Winthrop, Sup. Dev. & Integ. Mgt. (7)
Ronald H. Hazelton, Instruct/Anal. (8)
Hubert C. Farrell, Mfg. Bus. Mgmt. (9)
Raymond J. Holland, Prod. Supervision (14)
Robert J. Burtis, Prog. Mgmt. (25)
Dominick R. Virgilio, Prog. Qual. Mgmt. (25)
Betty J. Bohlander, A/C & Marine Prog. Staff (25)
Felice A. Inserro, ILS Dig. TPS Eng. (25)
Alfred J. Shackles, Jr., Prog. Mgmt. (43)
George R. Nelson, Jr., Train. Sys. Prog. (47)
Joachim R. Dietzsch, Prod. (88)
Myron M. Mueller, ILS Eng. Mgmt. (106)
Pauline E. Sandman, OP Data Prep. (111)
Norman Reinertsen, Sr. V.P. Vehicle Div. (GHQ)

R.H. Hazelton

H.C. Farrell

R.J. Holland

D.R. Virgilio

B.J. Bohlander

F.A. Inserro

A.J. Shackles, Jr.

G.R. Nelson

M.M. Mueller

N. Reinertsen

P.E. Sandmann

Puzzled by PCs? Ask Grumman experts

Selecting the right personal computer can be quite a chore. Literally nonexistent a decade ago, the booming market now encompasses hundreds of equipment choices. And new hardware and software products arrive on the scene daily.

For expert advice in this area, Grumman has its own Personal Computing Center. The Center celebrated its first birthday in January, and more recently moved to larger quarters. It's now on the second floor of Grumman Headquarters Pod 2 — just above the lobby and overlooking the atrium.

Grummanites who haven't yet visited the Center will have their chance on May 14, 15 and 16. An open house will be held from 10:30 a.m. to 5:00 p.m. on those days.

"The Open House will offer exhibits and demonstrations of both hardware and software supported by the Center," says Linda Cavallaro, a technical support representative at the Center. In the hardware category, this includes the IBM PC, WANG PC, IBM PC/XT, ITT Xtra, Apple MacIntosh, DEC Rainbow, Delta Data computers, and various peripherals. The Center's software includes Lotus 1-2-3, dBASE III, Multimate, Relay, Project Scheduler 5000, and Execuvision.

In addition, systems now being evaluated will be exhibited, including the Grid Compass and Data General/One portable computers, the Polaroid Palette and Celtic Camera presentation graphics systems, and Dialcom electronic mail service.

Though officially part of the Grumman Data Systems division, the Personal Computing Center supports the entire corporation. It was formed at the beginning of 1984 to keep the purchases of microcomputers consistent throughout Grumman, and to stay abreast of the ever-changing technological picture.

The Personal Computing Center will hold an open house on May 14, 15, and 16, from 10:30 a.m. to 5 p.m. in its new Grumman Headquarters home.

The group obtains computer hardware and software on loan for 30-day trial periods, makes an evaluation, and either purchases or returns them. Services to Grummanites include needs analyses, hands-on training, product evaluations, work sessions, and hardware and software demonstrations. As such, the Personal Computing Center often plays the role of an in-house consultant.

Holly Adler, another technical support representative, stresses that the Center's role is to provide the Grumman community with information about PCs. "The Center can make recommendations but it is up to a department's management to determine whether a PC would be a worthwhile investment," says Adler.

The Center is composed of a demonstration area consisting of ten workstations, and a work center consisting of eight workstations. Any Grummanite may reserve time on a PC within the work center, and bring in a task to be automated.

At this time the Personal Computing Center primarily serves Long Island Grummanites, but there are plans to expand its horizons. For instance, in the past, a PCC technical support representative was assigned to the Space Transportation System Operations Contract observation team in Houston.

For over-the-phone advice, call the Center's Hotline, Ext. (111) 58100. ■

Obituaries

Norman C. Leigers, Power Plant, Plant 77, died March 27 at the age of 61. He had been with the company since 1970 and resided at 1008 E. 15th Court, Stuart, Florida.

Gerald M. Garett, ILS Electronic Packaging, Plant 6, died March 29, 1985 at the age of 63. He had been with the company since 1963 and resided at 194 Evergreen Ave., Middle Island, N.Y.

Frank E. Cassot, Program Project Management, E-2/C-2A, Plant 25, died April 4 at the age of 68. He had been with the company since 1972 and resided at 16 Massapequa Ave., Massapequa Park, N.Y.

Reading tutors teach self-esteem as well as ABCs

Grummanites help tackle a problem of embarrassing dimensions

Imagine going through life unable to read road signs, your child's homework, or a job application form. That's what life is like for the functionally illiterate adult.

Amidst America's plenty are thousands of illiterate adults — as many as 20 percent of the adult population, according to some surveys. Illiteracy exacts a high social cost, because illiterate adults are disproportionately represented among the poor, the unemployed, prisoners, and welfare recipients.

The Literacy Volunteers of America is leading the fight against illiteracy by offering free, private tutoring. It takes no small amount of guts and determination for a non-reading adult to seek this help.

Take the case of Gloria, a 40-year old housewife and mother who reads at a third- to fourth-grade level. Gloria is being tutored two hours a week by Carolyn Wine, an administrative assistant for Personnel Liaison in Bethpage.

Gloria wants eventually to attend adult education and earn a high school diploma. A drug counselor recommended Literacy Volunteers. Gloria has never had a full-time, permanent job and is now separated from her husband. "I need to stand on my own now," she says.

Pegged as a poor student early in life, Gloria needed more special attention than was routine in those days. She failed a grade and dropped out as soon as she legally could — in tenth grade.

"Things are a lot different today — everyone is more concerned," she comments. "When I was in school, instead of giving me extra help, the teacher would send me out in the hall to hang up papers or something."

Gloria candidly admits her reading is poor. "My kids would say, 'Gee, ma, don't do my homework — you do it wrong'," she laments.

The adult non-reader must employ clever ruses in order to cope with everyday life. For instance, when Gloria originally took the written driver's permit test, she guessed the answers. She kept taking the true-false test until she finally passed.

Gloria never drives far from her Suffolk home, relying on landmarks rather than street signs, and used to draw pictures when making up a grocery list. She had intended to sign up for some sort of reading class, even if it involved paying a fee (Literacy Volunteers' services are free).

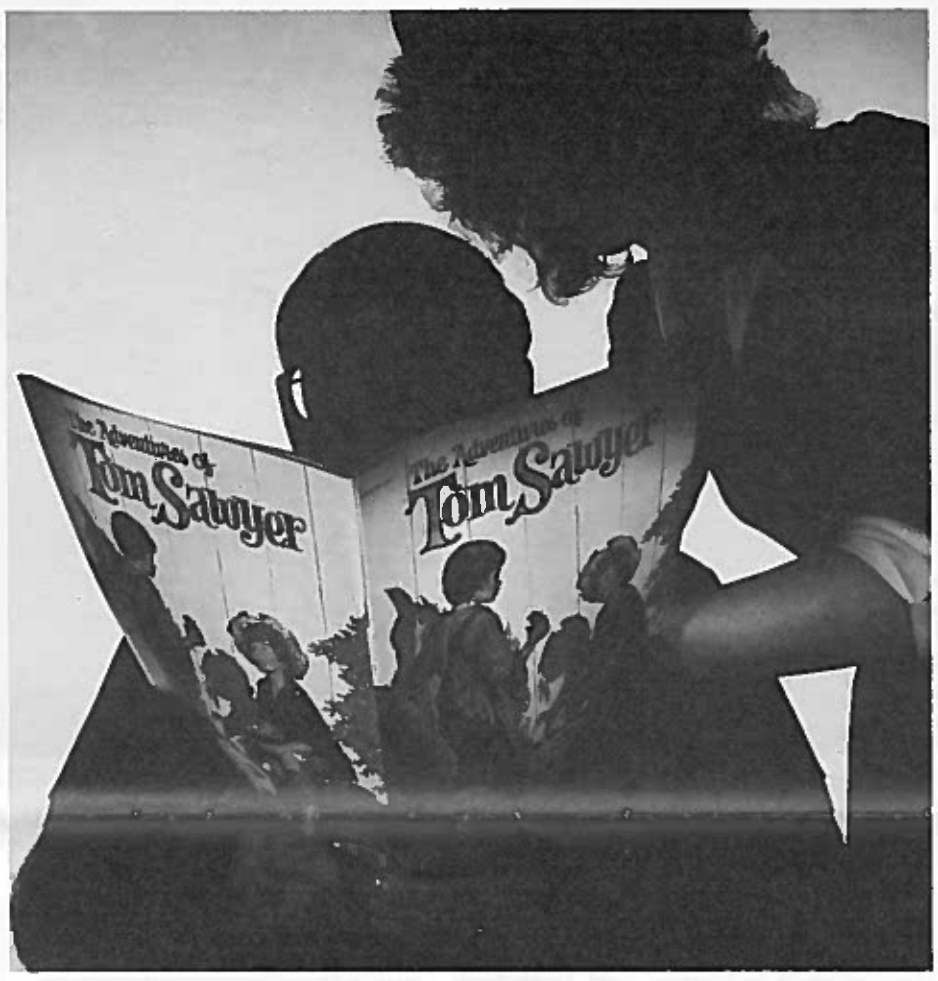
Gloria and her tutor, Carolyn Wine, work well together. When she becomes discouraged, Wine is highly supportive, she says.

"I'm not there yet, but I'm getting there," Gloria declares. "Carolyn is a great teacher...it's nice when you work with somebody who is that patient."

Wine is now teaching Gloria to recognize various letter clusters and words by sight. "It's slow going, but the times when she says, 'I was able to read this on my own', make it all worthwhile," Wine says.

Literacy Volunteers recently held a recognition ceremony for students. "That made me feel good," says Gloria. "Instead of pointing and saying, 'look at that junkie', they really make me feel like I'm worth something."

Literacy Volunteers of America draws men and women from all age groups and occupations.



Wine and fellow Grummanites Walter Schultz and Vic Bloom learned about the illiteracy problem, and Literacy Volunteers, through articles in *Grumman World* and *Plane News*. Bill Ahrens, on the other hand, had planned for a while to become a literacy volunteer — the Grumman-sponsored program just made it easier.

Ahrens at one time envisioned becoming a teacher. He works in Bethpage in the Press department as a roller operator.

His student is a 34-year-old truck driver who wants to become a dispatcher in order to spend more time with his wife and children. Improved reading will improve his job prospects. He meets with Ahrens for two hours each Sunday.

Ahrens uses a variety of reading materials, including flash cards and road maps. "You have to find a common interest," he notes. "If your student is interested in sports, you go over the sports pages."

Another technique: the student tells a story, Ahrens writes it, and then the student reads it aloud. Though progress was slow at first, Ahrens feels his student is now moving more rapidly than average.

Walter Schultz, a contract review specialist in the Treasurer's office in Bethpage, tutors a 28-year-old warehouseman who knows the alphabet and can print his name, but has minimal reading skills. "It requires a lot of thought and innovation to find the right way to teach him," Schultz notes.

One aid Schultz employs is Operation Alphabet, a teaching package developed by Literacy Volunteers. The one-on-one nature of the program is a plus, since most students cannot survive in a classroom.

A tutor must devote a minimum of one year per student, during which the average student progresses one grade. A lot depends on the student's motivation.

Schultz sees improvement in his student's skills, and with that, more motivation and confidence. He encourages others to sign up. The only prerequisite for tutors is a high school diploma. "It's a lot of work, and for quite a while, you might not see the result," he says. "But eventually you will, which is immensely satisfying."

Vic Bloom, director of design engineering for Integrated Logistics Support, tutors a 24-year old man once a week for two hours. Since they live 15 miles apart, they alternate between Bloom's town library and the student's.

Bloom's student became a father at age 16 and dropped out of school. He is a roofer by trade and read at the fourth-grade level when the sessions began. "I think we've advanced considerably," Bloom says, noting that students get re-tested after 50 hours' tutoring.

Bloom credits the man with both motivation and intelligence. "He doesn't have trouble learning — he has trouble reading," he notes.

The student has been driving illegally for several years, so an immediate goal is to obtain a driver's license. Although the man could have taken the test verbally, he didn't know the meaning of words such as "yield" and "intersection" and was afraid to try.

In his tutoring, Bloom utilizes a New York drivers' manual and a "Jack and the Beanstalk" story book, which the student wants to be able to read to his daughter.

"The program isn't a handout," says Bloom. "The people have to be motivated enough to come on their own time and to practice at home. They're working to help themselves." ■

Tutoring classes begin May 6

Since last fall, 18 Grummanites have served as reading tutors in a program funded by the corporation and conducted under the auspices of the Literacy Volunteers of Long Island, Inc. Next month, another group of prospective tutors will be trained.

For those interested in becoming tutors, orientation will be on Thursday May 2, from 4:30 to 6 p.m. in the Grumman Headquarters third floor conference room. Training begins on May 6 and continues twice a week, Monday and Thursday nights, until May 23. For further details, contact Sharon Grosser, Ext. (111) 53254.

Grummanites who work off Long Island are encouraged to contact their local chapter of Literacy Volunteers. If you don't know whom to contact, write or call the national headquarters: 404 Oak Street, Syracuse, N.Y. 13203, (315) 474-7039.

Re-assign duties in D.C. office

On April 17, Grumman Chairman Jack Bierwirth announced the re-assignments of responsibilities in the Washington D.C. Office.

Grumman Corporation Vice President George Kinnear is the deputy director of Washington Operations.

Grumman Corporation Vice President George Brown is director of Washington Relations, and is responsible for public issues policies (other than issues pertaining to the national defense).

Grumman International Vice President Richard Milburn is director of International Operations. He is responsible for all Washington Office activities in support of the corporation's overseas programs and marketing initiatives.

In a related move, Andrew Bradick has been appointed director, Defense Programs in Grumman International. In this position, he has worldwide responsibility for marketing of all Grumman military products and services. He formerly had served in the Washington Office. ■

GrummanWorld

April 26, 1985

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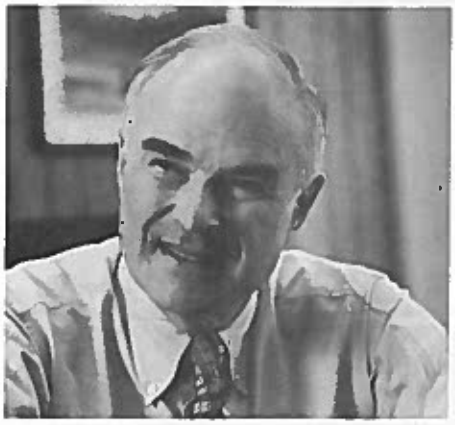
Forward-thinking investments — pg. 1
D'Amato addresses PAC — pg. 1
In the thick of the Space Station race — pg. 1
The battle against illiteracy — pg. 7

A letter from the Chairman



A couple of weeks ago, each one of us had to face the income tax deadline. There's the usual amount of griping and complaining, but we pay our taxes because we have to – because we're good citizens, members of the community. "I'm a taxpayer" in our country means I have rights, I'm part of the system.

So it rankles when we read about people with sizable incomes who manage to pay no taxes at all.

It rankles to hear about companies that do that.

It especially rankles when one of the companies they're talking about is Grumman. But the fact is that on April 15, Grumman Corporation paid over $20 million in taxes.

Beginning in 1976, the Treasury Department authorized the "completed contract" method of tax reporting for defense contractors. Under this method, the profit or loss from contracts is not reportable until the work is finished. It is based on the theory that companies working on long-term contracts – jobs that can take several years – cannot know how much profit or loss has been incurred until the job is done. (Under the old system, Grumman paid taxes on 1970 earnings, not realizing until mid-1971 that it was actually going to lose substantial sums on that first F-14 contract.)

The completed contract method does not reduce taxes – it only defers the payment of tax or the reporting of a tax loss.

Grumman's 1985 and 1986 federal tax payments will be in the vicinity of a quarter of a billion dollars. These payments will include taxes for current as well as recent years.

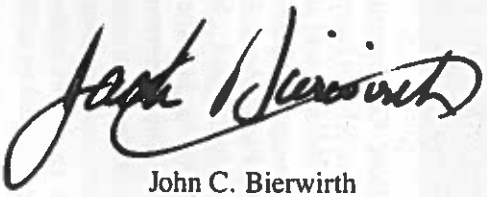
Congress and the President have enacted a series of corporate tax incentives to encourage companies to invest money in their factories and in new technologies. Critics of these incentives point out that in the 60s, taxes paid by American companies covered about 25 percent of government spending, exclusive of Social Security. By 1984, that had dropped to only 8.5 percent. Those same critics would point out that most of the companies that received large investment tax credits do not maintain their investment programs.

These issues and the current tax structure are serious problems, and most of us would agree that our tax system is in need of reform.

But this cannot be argued: Grumman has used its investment tax credits for the intended purpose. We are in the fourth year of a $250 million capital improvement program. Last year, we added nearly 600,000 square feet of office, laboratory, and manufacturing space; we will add another 275,000 square feet this year. We have also provided a thousand new jobs.

We can be proud of the way Grumman has faced up to its obligations, because the way we run our business is an extension of ourselves. And Grumman is a good corporate citizen, a member of the community.

A taxpayer.



John C. Bierwirth
Chairman

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